

of trips produced in Zone 1, multiplied by the number of trips attracted to Zone 2, multiplied by a travel time factor between the zones, and then divided by the sum of all zone attractions multiplied by their travel time factors.

$$T_{ij} = \frac{P_i * A_j * F_{ij}}{\sum_{x=1,n} A_x * F_{tx}}$$

where:

T_{ij} = the number of trips sent from zone i to zone j

P_i = the number of trips produced in zone i

A_j = the number of trips attracted to zone j

F_{ij} = the travel time factor between zone i and zone j

n = the total number of zone

i = the origin zone number

j = the destination zone number

x = any zone number

The travel time factor or friction factor (F) is critical to the gravity model distribution and must be derived empirically. The travel time factor is dependent on the distance between the traffic zones and the time necessary to travel that distance. The travel time factor is also dependent on the trip purpose. In order to derive the travel time factor, a gravity model calibration program was run with an initial value of travel time factor and a trip length frequency curve for each trip purpose. The initial travel time factor used in the Sanford model was 100 for all trip purposes and time increments. Figure 7 through Figure 10 show the trip length frequency curves for each trip purpose, and Tables 17 through Table 19 in Appendix C show the actual values for the trip length frequency distribution.

MODEL CALIBRATION

The purpose of the traffic model is to predict the traffic on a street system at some future point in time; however, if the model does not do this accurately, then it is useless. The major test of a traffic model's validity is whether or not the model will duplicate the existing traffic pattern on the base year street network. The actual calibration of the model is an iterative process in which incremental changes are made either in the trip generation, the trip distribution, or the street network. The goal of each change is to make the model more accurately reflect the real world conditions upon which it is based. Only when the model can adequately reflect traffic in the base year can